

CLAIMS

- 5 1. Installation for the filtration of water by membranes, comprising a raw water inlet (9), connection to a drain (8), a means of outlet of produced water (31), the membranes (20) being immersed in a filtration volume filled with water to be filtered, whose height of water above the said membranes is adapted to create a differential pressure sufficient to provoke the filtration through these membranes,
- 10 wherein the membranes (20) are of the fibre type with outer skin substantially disposed in a U-shape, whose two open ends are located at the bottom, the potting being carried out at the low point of the said membranes (20),
- characterised in that the membranes (20) are disposed in cylindrical containers (21) thus forming modules, each module (12) comprising a raw water
- 15 feed pipe (14) connected to the top section of the module.
2. Installation according to Claim 1, characterised in that the potting of the two ends of a same membrane is carried out at the same point.
- 20 3. Installation according to either one of Claims 1 or 2, characterised in that the maximum pressure difference created in the filtration volume is approximately 0.6 bar.
4. Installation according to Claim 3, characterised in that the nominal
- 25 pressure difference in the filtration volume is between 0.4 and 0.5 bar.
5. Installation according to Claim 4, characterised in that the membranes (20) are disposed in membrane modules (12).
- 30 6. Installation according to Claim 5, characterised in that the membrane area of each module (12) is substantially 125 m².

7. Installation according to Claim 6, characterised in that the modules (12) are cylindrical containers (21) substantially having a diameter of 30 cm and a length of 80 cm.

5 8. Installation according to any one of Claims 5 to 7, characterised in that the modules (12) are disposed substantially at the bottom of a basin (2).

9. Installation according to a Claim 8, characterised in that the modules (12) are gathered in groups (11) around means (17) of collection of water coming from
10 the filtration, to which they are connected.

10. Installation according to Claim 9, characterised in that each group (11) comprises two substantially parallel lines of 10 modules (12).

15 11. Installation according to any one of Claims 5 to 10, characterised in that the modules (12) are disposed substantially vertically.

12. Installation according to Claim 11, characterised in that the means of feeding the modules (12) with raw water are feed pipes (14) whose free ends (16)
20 are located substantially at mid-height of the filtration basin (2).

13. Installation according to Claim 12, characterised in that the feed pipes (14) are, at their free ends (16), oriented downwards and in that the installation comprises evacuation channels (10) located under the ends (16) of theses feed
25 pipes (14), the said channels (10) being connected to a drainage valve (A2) discharging into the drain (8).

14. Installation according to Claim 9, characterised in that each collector means (17) comprises a valve (AV11, AV12, AV13, AV14) separating this collector
30 means (17) from a means of transfer (19) of the produced water to a produced water outlet valve (AV3) and a storage means (30).

15. Installation according to Claim 14, characterised in that it comprises a line (32) for the re-injection of produced water into the transfer means (19)

upstream of the produced water outlet valve (AV3) and a re-injection pump (33) located on this line (32).

16. Installation according to Claim 15, characterised in that it comprises a station for the injection of chlorine (34) and a station for the injection of soda (35) discharging into the re-injection line (32).

17. Installation for the filtration of water by membranes according to Claim 5, characterised in that the membrane modules (12) are disposed at the bottom of a dry compartment, and in that the modules are fed by gravity with water to be filtered by closed pipes, these pipes also serving for conveying the backwashing water.

18. Method of filtration of water by immersed membranes, of the ultrafiltration membrane type, the filtration through the membranes being carried out using, as a source of differential pressure, the height of water present in the basin (2) in which the membranes (20) are immersed and are of the fibre type with outer skin, potted at the low point of the said membranes (20),

characterised in that the membranes (20) are disposed in cylindrical containers (21) thus forming modules, each module (12) comprising a raw water feed pipe (14) connected to the top section of the module.

19. Method of rehabilitation of an existing water purification unit of the so-called sand basin type, comprising a basin (2) provided with a bottom floor (4), an intermediate floor on which the sand bed stands, a raw water inlet (9), characterised in that it comprises stages of removal of the sand bed, of destruction of the intermediate floor, of installation of at least one intermediate channel (10) for the evacuation of washing sludges located substantially at mid-height of the filtration basin (2) and closed by a valve (AV2) discharging into the drain (8), of installation on the bottom floor (4) of a series of membrane ultrafiltration modules (12), the membranes (20) being of the fibre type with outer skin potted at their low point, disposed in containers (21) and the operating pressure of these membranes being created by the height of raw water stored in the basin (2) above these membranes.

20. Method of rehabilitation according to Claim 19, characterised in that it comprises a phase of testing the integrity of the membranes (20) of a group (11) comprising the following stages:

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- closing the produced water valve of a collector (18),
 - injection of compressed air into the collector of the group (11),
 - emptying by reverse filtration ("permeation") of the water contained on the permeate side,
 - stopping the compressed air supply,
 - 10 - measuring the pressure drop.
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